CBI SUBSTANTIATION
PMN filing

This Document Contains CBI: **Yes☒** **NO☐**

Technical Contact: Virginia Cook

Technical Contact Phone Number: 4085438819 | **Submission number (if known):** Click here.

Submitting Company Name: JSR Micro

Information element(s) claimed as CBI: Please identify the appropriate information element(s) that you are substantiating from the list below. For any information element that is not specifically identified as subject to a confidentiality claim and substantiated as such in your response to this letter, it shall be determined that you have waived your CBI claim, pursuant to 40 C.F.R. § 2.205(d).

You are responsible for substantiating each information element claimed as CBI. If a single substantiation response applies for all information claimed as CBI, you should indicate this in your substantiation response. If different substantiation responses are necessary to support CBI claims for different information types, you should provide separate substantiation responses for each information type, clearly identifying the information for which each substantiation applies in the free text boxes (e.g. Question B) or in the additional information box at the end of this form.

☐ Type of Notice (Page 1)	☐ Byproducts (Part I Section B.7)
☐ Signature and Date of Authorized Official (Page 2)	☒ Production Volume (Part I Section C.1)*
☐ Signature and Date of Agent (Page 2)	☒ Category of Use (Part I Section C.2.a.1)*
☐ Person Submitting Notice (Part I Section A.1.a)	☐ Use Production (Part I Section C.2.a.4)*
☐ Agent (Part I Section A.1.b)	☒ % in Formulation (Part I Section C.2.a.6)*
☐ Joint Submitter (Part I Section A.1.c)	☐ % of Substance Expected Per Use (Part I Section C.2.a.8)*
☐ Technical Contact (Part I Section A.2)	☐ Generic Use Description (Part I Section C.2.b)
☐ Prenotice Communication (PC) (Part I Section A.3)	☐ Site Identity (Part II Section A.1.a)
☐ Previously Submitted Exemption Application (Part I Section A.4)	☐ Site Operations (Part II Section A.1.b)
☐ Previously Submitted Bona Fide (Part I Section A.5)	☒ Amount and Duration (Part II Section A.1.c)*
☐ Type of Notice (Part I Section A.6)	☒ Process Description (Part II Section A.1.d)*
☐ Chemical Class (Part I Section B.1.a)	☐ Worker Activity (Part II Section A.2.1)
☐ Chemical Name/CAS Registry Number (Part I Section B.1.b)**	☐ Protective Equipment/Engineering Controls (Part II Section A.2.3)
☐ Method (Part I Section B.1.c)	☒ Physical Form(s) & % New Substance (Part II Section A.2.5)
☐ Molecular Formula (Part I Section B.1.d)**	☐ # of Workers Exposed (Part II Section A.2.8)
☐ Chemical Structure Diagram for Class I (Part I Section B.1.e)**	☐ Maximum Duration (Part II Section A.2.10-11)
☐ Precursor Substances Class II (Part I Section B.1.e.1)*	☐ Release Number and Amount of New Substance Released (Part II Section A.3.1-2)
☐ Reaction or Process for Class II (Part I Section B.1.e.2)*	☐ Medium of Release and Control Technology and Efficiency (Part II Section A.3.4-5)
☐ Range of Composition and Typical Composition for Class II (Part I Section B.1.e.3)*	☐ Destinations of Releases to Water (Part II Section A.3.7)
☒ Polymer Information (Part I Section B.2.a)**	☒ Operation Description (Part II Section B.1)*

☒ Monomer or Other Reactant Specific Chemical Name (Part I Section B.2.b.1)*	☐ Letter of Activity and # of Workers Exposed (Part II Section B.2.1-2)
☐ Monomer or Other Reactant Specific Chemical Name Typical Composition (Part I Section B.2.b.3)	☐ Duration of Exposure (Part II Section B.2.4)
☒ Monomer or Other Reactant Specific Chemical Name Include in Identity (Part I Section B.2.b.4)*	☒ Protective Equipment/Engineering Controls/Physical Form/ % New Substance/% in Formulation (Part II Section B.2.6-7)
☐ Monomer or Other Reactant Specific Chemical Name Max Residual (Part I Section B.2.b.6)	☒ Release Number and Amount of New Substance Released (Part II Section B.2.9-10)
☐ Method Used to Obtain Specific Chemical Identity (Part I Section B.2.c)	☐ Media of Release & Control Technology (Part II Section B.2.12)
☒ Current Chemical Abstracts (CA) Name and Number for Polymer (Part I Section B.2.d)**	☐ Byproducts (Part II Section B.2.14)
☒ Chemical Structure Diagram (Part I Section B.2.e)**	☐ Pollution Prevention Information (PMN page 11, form page 16)
☒ Impurities (Part I Section B.3)	☒ Attachments (Part III, PMN page 12, form page 17)
☒ Synonyms (Part I Section B.4)	☒ Physical and Chemical Properties Worksheet (PMN page 13, Form page 18)***
☒ Trade Identification (Part I Section B.5)	

☐**Other information elements claimed as CBI** (Please list any other CBI claim or any TSCA Section 14(c)(2) assertion not listed above. In some cases, it may be appropriate to group the information into a class of information rather than responding to each item claimed as CBI. If you are asserting a category of information, please identify all information elements within that category):

Click or tap here to enter text.

I. REQUIRED FOR ANY IDENTIFIED CBI CLAIM

A. Do you believe that any information element claimed as CBI is exempt from substantiation pursuant to TSCA section 14(c)(2)[1] ?

☑ Yes
☐ No

If you answered yes, you must identify the specific information element(s), provide the specific exemption(s) and answer no further questions. For any information element that is not exempt, please respond to all of the questions below.

If the Agency disagrees with this assertion, you may be asked to provide additional information to support your claim.

Polymer Information (Part I Section B.2.a)**- does not need substantiation per TSCA Section 14(c)(2)(G)
Monomer or Other Reactant Specific Chemical Name (Part I Section B.2.b.1)*- does not need substantiation per TSCA Section 14(c)(2)(G)
Monomer or Other Reactant Specific Chemical Name Include in Identity (Part I Section B.2.b.4)*- does not need substantiation per TSCA Section 14(c)(2)(G)
Current Chemical Abstracts (CA) Name and Number for Polymer (Part I Section B.2.d)**- does not need substantiation per TSCA Section 14(c)(2)(G)
Chemical Structure Diagram (Part I Section B.2.e)** - does not need substantiation per TSCA Section 14(c)(2)(G)
Production Volume (Part I Section C.1)* - does not need substantiation per TSCA Section 14(c)(2)(F)
Category of Use (Part I Section C.2.a.1)* - does not need substantiation per TSCA Section 14(c)(2)(E)

% in Formulation (Part I Section C.2.a.6)*- does not need substantiation per TSCA Section 14(c)(2)(D)
Amount and Duration (Part II Section A.1.c)* - does not need substantiation per TSCA Section 14(c)(2)(F)
Process Description (Part II Section A.1.d)* - does not need substantiation per TSCA Section 14(c)(2)(A)
Operation Description (Part II Section B.1)*- does not need substantiation per TSCA Section 14(c)(2)(C)
% in Formulation (Part II Section B.2.7) - does not need substantiation per TSCA Section 14(c)(2)(D)
Attachments (Part III, PMN page 12, form page 17)

- Spectrum - does not need substantiation per TSCA Section 14(c)(2)(G)
- Structure - does not need substantiation per TSCA Section 14(c)(2)(G)
- Process diagram – Site controlled by others - does not need substantiation per TSCA Section 14(c)(2)(A)
- Process diagram – Site controlled by submitter - does not need substantiation per TSCA Section 14(c)(2)(A)

Physical and Chemical Properties Worksheet (PMN page 13, Form page 18)***- does not need substantiation per TSCA Section 14(c)(2)(G)

B. Will disclosure of any information element claimed as CBI likely result in substantial harm to your business's competitive position? *(If you answered yes, please describe with specificity the substantial harmful effects that would result to your competitive position if the CBI information element is made available to the public.)* *If you are claiming multiple information elements, please make sure to provide information for EACH element you identified above. If a single substantiation response applies for all information claimed as CBI, you should indicate this in your substantiation response.*	☑ Yes ☐ No

Impurities (Part I Section B.3) - The company is asserting as confidential the impurities in the LVE material. Impurities in the LVE substance originate from raw materials used to manufacture the substance and/or process conditions used for its manufacture. The identities of the impurities could be sufficient information for a competitor to deduce the identities of raw materials and/or process conditions used to manufacture the LVE substance. Divulging raw materials and/or process conditions would create competitive vulnerabilities.
Synonyms (Part I Section B.4)- the company's internal nickname
The company is asserting as confidential its internal nickname for the substance. The substance is a component of several photoresist formulations sold by JSR to semiconductor companies. Photoresists are used to manufacture semiconductor chips. JSR uses nicknames as a further mask of the chemical identity of the subject substance and mixture. This extra layer of protection helps ensure that, even if a competitor gains access to the nickname, it will still face significant difficulties in learning the chemical identity of the materials. Divulging that nickname information would eliminate this layer of protection and create sensitive competitive vulnerabilities. The substance is used in several new photoresist formulations.
Trade Identification (Part I Section B.5) - Since this product name is being used for dedicated customer and usage of this material can be easily expected based on this name, 3rd party can know a part of customer device process information.
% New Substance (Part II Section A.2.5) - Since it can tell viscosity information, 3rd party can estimate film thickness of this material and assume a part of customer device information. And also competitor can assume cost structure of this product.
% New Substance/% in Formulation (Part II Section B.2.6-7) - Since it can tell viscosity information, 3rd party can estimate film thickness of this material and assume a part of customer device information. And also competitor can assume cost structure of this product.
Amount of New Substance Released (Part II Section B.2.9-10) - Since it can tell usage of this material at customer, 3rd party can estimate customer production information like a capacity.
Attachments (Part III, PMN page 12, form page 17) Product SDS – Product SDS contains Trade Identification.

Since the product name is being used for dedicated customer and usage of this material can be easily expected based on this name, 3rd party can know a part of customer device process information.

C. To the extent your business has disclosed any information to others (both internally and externally), what precautions has your business taken? Please identify the measures or internal controls your business has taken to protect the information claimed as confidential.

1.	Non-disclosure agreement required prior to access.	☑ Yes ☐ No
2.	Access is limited to individuals with a need-to-know	☑ Yes ☐ No
3.	Information is physically secured (e.g. locked in room or cabinet) or electronically secured (encrypted, password protected, etc.).	☑ Yes ☐ No
4.	Other internal control measure(s). *(If yes please explain below.)* Click or tap here to enter text.	☐ Yes ☑ No

D. Does any of the information claimed as confidential appear in any public documents, including (but not limited to) safety data sheet, advertising or promotional material, professional or trade publication, or any other media or publications available to the general public?

☑ Yes ☐ No

(If you answered yes, please explain why the information should be treated as confidential.)

Impurities (Part I Section B.3)- No, this information does not appear in any public documents.
Synonyms (Part I Section B.4)- the company's internal nickname – No, this information does not appear in any public documents.
Trade Identification (Part I Section B.5) – Yes, this information appear in the SDS. JSR provides SDSs to customers only after the customer signs an NDA. JSR has not disclosed the information to anyone other than a governmental body or someone who is bound by an NDA.
% New Substance (Part II Section A.2.5) - No, this information does not appear in any public documents.
% New Substance/% in Formulation (Part II Section B.2.6-7) - No, this information does not appear in any public documents.
Amount of New Substance Released (Part II Section B.2.9-10) - No, this information does not appear in any public documents.
Attachments (Part III, PMN page 12, form page 17) Product SDS – Yes, JSR provides SDSs to customers only after the customer signs an NDA. JSR has not disclosed the information to anyone other than a governmental body or someone who is bound by an NDA.

E. Does any of the information you are claiming as CBI contain (a) trade secret(s)[2] ?

☑ Yes ☐ No

(If you answered yes, please explain the reason for your belief and attach copies of those pages containing such information with brackets around the text that you claim to be (a) trade secret(s).)

Impurities (Part I Section B.3)- The company is asserting as confidential the impurities in the LVE material. Impurities in the LVE substance originate from raw materials used to manufacture the LVE substance and/or process conditions used for its manufacture. The identities of the impurities would be sufficient information for a competitor to deduce the identities of raw materials and/or process conditions used to manufacture the LVE substance. Divulging raw materials and/or process conditions could create competitive vulnerabilities. Impurity information is kept confidential within JSR, with employees prohibited by contract from disclosing such information to third parties and with documents bearing such information marked company confidential. Customers also are prohibited by contract from disclosing such information to third parties.

Synonyms (Part I Section B.4)- The company is asserting as confidential its internal nickname for the substance. The substance is a component of several photoresist formulations sold by JSR to semiconductor companies. Photoresists are used to manufacture semiconductor chips. JSR uses nicknames as a further mask of the chemical identity of the subject substance and mixture. This extra layer of protection helps ensure that, even if a competitor gains access to the nickname, it will still face significant difficulties in learning the chemical identity of the materials. This information is kept confidential within JSR, with employees prohibited by contract from disclosing such information to third parties and with documents bearing such information marked company confidential. Customers also are prohibited by contract from disclosing such information to third parties. Divulging that nickname information would eliminate this layer of protection and create sensitive competitive vulnerabilities. The substance is used in several new photoresist formulations.
Trade Identification (Part I Section B.5) – It can tell a part of customer device process.
% New Substance (Part II Section A.2.5) -It can tell a part of customer device process and the product formulation.
% New Substance/% in Formulation (Part II Section B.2.6-7) - It can tell a part of customer device process and the product formulation.
Amount of New Substance Released (Part II Section B.2.9-10) - It can tell a part of customer device manufacturing process and target device.
Attachments (Part III, PMN page 12, form page 17) Product SDS – It can tell a part of customer device process.

F. If you assert a claim of confidentiality that is less than 10 years (see TSCA section 14(e)(1)(B)[3]), then please indicate the number of years (between 1-10 years) or specific date of which the claim is withdrawn[4]?

Click or tap here to enter text.

G. Has the EPA, another federal agency, or court made any confidentiality determination regarding information associated with this substance?

(If you answered yes, please explain the outcome of that determination and provide a copy of the previous confidentiality determination or any other information that will assist in identifying the prior determination.)

☐ Yes
☑ No

Click or tap here to enter text.

Additional comments:

Click or tap here to enter text.

II. REQUIRED ONLY FOR CHEMICAL IDENTITY CBI CLAIMS

A. Are you claiming a specific chemical identity as CBI?

(If you answered yes, please respond to questions below.
If you answered no, please leave all questions below blank)

☑ Yes
☐ No

B. Is the chemical substance (or mixture) on the confidential portion of TSCA Inventory?

☐ Yes
☑ No

C. Has the chemical substance (or mixture) been offered for commercial distribution?

(If you answered yes, please explain why the information should be treated as confidential.)

☐ Yes
☑ No

Click or tap here to enter text.

D. Is the chemical substance known to be in US commerce? ☐ Yes ☑ No

(If you answered yes, please explain why the information should be treated as confidential.)

Click or tap here to enter text.

E. Would disclosure of the specific chemical name release confidential process information? ☑ Yes ☐ No

(If you answered yes, please explain why the information should be treated as confidential.)

The chemical identity provides the competitive advantage for this substance in the photoresist marketplace. The company has spent several years and millions of dollars to build an inventory of this chemical substance that provides unique abilities to our customers. New formulations are continually being developed that leverage off existing substances such as that which is the subject of this submission. Any potential public disclosure would have a severe impact on existing sales and future development.

F. In the case of a mixture, would disclosure of the chemical name disclose a portion of the mixture comprised by any of the chemical substances in the mixture? ☐ Yes ☐ No

(If you answered yes, please explain why the information should be treated as confidential.)

Not applicable

Additional comments:

Click or tap here to enter text.

III. SUBSTANTIATION CERTIFICATION

Do you wish to claim this substantiation as CBI? ☑ Yes ☐ No

TSCA section 14(c) requires that persons asserting a CBI claim shall certify to the validity of the claims. By the marking of a yes, you are certifying to the truth of the below statements.

I hereby certify to the best of my knowledge and belief that all information entered on this form is complete and accurate.
I further certify that, pursuant to 15 U.S.C. § 2613(c), for all claims for confidentiality made with this submission, all information submitted to substantiate such claims is true and correct, and that it is true and correct that
(i) My company has taken reasonable measures to protect the confidentiality of the information;
(ii) I have determined that the information is not required to be disclosed or otherwise made available to the public under any other Federal law;
(iii) I have a reasonable basis to conclude that disclosure of the information is likely to cause substantial harm to the competitive position of my company; and
(iv) I have a reasonable basis to believe that the information is not readily discoverable through reverse engineering.

Any knowing and willful misrepresentation is subject to criminal penalty pursuant to 18 U.S.C. § 1001.

* EPA believes this information element to be exempt from substantiation for this activity.

** EPA believes this information element to be exempt from substantiation for this activity (only applies prior to the date on which a chemical substance is first offered for commercial distribution).

*** EPA believes Spectra information elements to be exempt from substantiation for this activity (only applies prior to the date on which a chemical substance is first offered for commercial distribution).

[1] **"TSCA Section 14(c)(2) states:**

Information generally not subject to substantiation requirements

Subject to subsection (f), the following information shall not be subject to substantiation requirements under paragraph (3):

(A) Specific information describing the processes used in manufacture or processing of a chemical substance, mixture, or article.

(B) Marketing and sales information.

(C) Information identifying a supplier or customer.

(D) In the case of a mixture, details of the full composition of the mixture and the respective percentages of constituents.

(E) Specific information regarding the use, function, or application of a chemical substance or mixture in a process, mixture, or article.

(F) Specific production or import volumes of the manufacturer or processor.

(G) Prior to the date on which a chemical substance is first offered for commercial distribution, the specific chemical identity of the chemical substance, including the chemical name, molecular formula, Chemical Abstracts Service number, and other information that would identify the specific chemical substance, if the specific chemical identity was claimed as confidential at the time it was submitted in a notice under section 2604 of this title.

[2] **"Trade secret"** is defined as "a secret, commercially valuable plan, formula, process, or device that is used for the making, preparing, compounding, or processing of trade commodities and that can be said to be the end product of either innovation or substantial effort." Public Citizen Health Research Group v. FDA, 704 F.2d 1280, 1288 (D.C. Cir. 1983).

[3] **"TSCA section 14(e)(1)(B) States"**

(B) in the case of information other than information described in subsection (c)(2)—

(i) for a period of 10 years from the date on which the person asserts the claim with respect to the information submitted to the Administrator; or

(ii) if applicable before the expiration of such 10-year period, until such time as—

(I) the person that asserted the claim notifies the Administrator that the person is withdrawing the claim, in which case the information shall not be protected from disclosure under this section; or

(II) the Administrator becomes aware that the information does not qualify for protection from disclosure under this section, in which case the Administrator shall take any actions required under subsections (f) and (g).

[4] Information with withdrawn CBI claims will be made available to the public without further notice.

Part I -- GENERAL INFORMATION -- Continued

Section B -- CHEMICAL IDENTITY INFORMATION -- Continued

3. Impurities
   (a) - Identify each impurity that may be reasonably anticipated to be present in the chemical substance as manufactured for commercial purpose. Provide the CAS Registry Number if available. If there are unidentified impurities, enter "unidentified."
   (b) - Estimate the maximum weight % of each impurity. If there are unidentified impurities, estimate their total weight %.

Impurity (a)	CAS Registry Number (a)	Maximum Percent % (b)	Confi-dential
[redacted]	[redacted]	0.01	X
[redacted]	[redacted]	0.01	X
[redacted]	[redacted]	0.01	X
[redacted]	[redacted]	0.01	X

Mark (X) this box if the data continues on the next page. ☐

Enter Attachment filename for Part I, Section B, 3. ☐

4. Synonyms - Enter any chemical synonyms for the new chemical identified in subsection 1 or 2.

[redacted] X

Enter Attachment filename for Part I, Section B, 4. ☐

5. Trade identification - List trade names for the new chemical substance identified in subsection 1 or 2.

[redacted] X

Enter Attachment filename for Part I, Section B, 5. ☐

6. Generic chemical name - If you claim chemical identify as confidential, you must provide a generic name for your substance that reveals the specific chemical identity of the new chemical substance to the maximum extent possible. Refer to the TSCA Chemical Substance Inventory, 1985 Edition, Appendix B for guidance on developing generic names.

Phenol, 4-ethenyl-, 1-substituted, polymer with 1-(1,1-substituted)-4-ethenylbenzene and ethenylbenzene, 2, 2'-(1,2-diazenediyl)bis[2-substituted]-initiated, hydrolyzed,

Enter Attachment filename for Part I, Section B, 6.

7. Byproducts - Describe any byproducts resulting from the manufacture, processing, use, or disposal of the new chemical substance. Provide the CAS Registry Number if available.

Byproduct (1)	CAS Registry Number (2)	Confi-dential

Mark (X) this box if the data continues on the next page. ☐

Part I -- GENERAL INFORMATION -- Continued

Section C -- PRODUCTION, IMPORT, AND USE INFORMATION:

The information on this page refers to consolidated chemical number(s): [X] **1** [ ] **2** [ ] **3** [ ] **4** [ ] **5** [ ] **6**

Mark (X) the "Confidential" box next to any item you claim as confidential.

1. Production volume -- Estimate the **maximum** production volume during the first 12 months of production. Also estimate the maximum production volume for any consecutive 12-month period during the first three years of production. Estimates should be on 100% new chemical substance basis. For a Low Volume Exemption application, if you choose to have your notice reviewed at a lower production volume than 10,000 kg/yr, specify the volume and mark (x) in the binding box. If granted, you are bound to this volume.

Maximum first 12-month production (kg/yr) (100% new chemical substance basis)	Maximum 12-month production (kg/yr) (100% new chemical substance basis)	Confidential	Binding Option Mark (X)
25000	50000	[X]	[ ]

Enter Attachment filename for Part I, Section C, 1. | CBI [ ]

2. Use Information -- You must make separate confidentiality claims for the description of the category of use, the percent of production volume devoted to each category, the formulation of the new substance, and other use information. Mark (X) the "Confidential" Box next to any item you claim as confidential.

a. (1) --Describe each intended category of use of the new chemical substance by function and application.
(2) --Mark (X) this column if entry column (1) is confidential business information (CBI).
(3) --Indicate your willingness to have the information provided in column (1) binding.
(4) --Estimate the percent of total production for the first three years devoted to each category of use.
(5) --Mark (X) this column if entry in column (4) is confidential business information (CBI).
(6) --Estimate the percent of the new substance as formulated in mixtures, suspensions, emulsions, solutions, or gels as manufactured for commercial purposes at sites under your control associated with each category of use.
(7) --Mark (X) this column if entry in column (6) is confidential business information (CBI).
(8) --Indicate % of product volume expected for the listed "use" sectors. Mark more than one box if appropriate. Mark (X) to indicate your willingness to have the use type provided in (8) binding.
(9) --Mark (X) this column if entry(ies) in column (8) is (are) confidential business information (CBI).

Category of use (**1**) (by function and application i.e. a dispersive dye for finishing polyester fibers)	CBI (**2**)	Binding Option Mark (X) (**3**)	Production % (**4**)	CBI (**5**)	% in Formulation (**6**)	CBI (**7**)	% of substance expected per use (**8**)					CBI (**9**)
							Site-limited	Consumer*	Industrial	Commercial	Binding Option	
Photosensitive material to capture the aerial images of the circuit pattern on the mask projected onto the silicon wafer.	X		100.0		[redacted]	X	0	0	100.0	0		

* If you have identified a "consumer" use, please provide on a continuation sheet a detailed description of the use(s) of this chemical substance in consumer products. In addition include estimates of the concentration of the new chemical substance as expected in consumer products and describe the chemical reactions by which this substance loses its identity in the consumer product.

Mark (X) this box if the data continues on the next page. [ ]

b. Generic use description — If you claim any category of use description in subsection 2a as confidential, enter a generic description of that category. Read the Instruction Manual for examples of generic use descriptions.

Polymer for Photolithography

Enter Attachment filename for Part I, Section C, 2. b. | CBI [ ]

3. Hazard Information -- Include in the notice a copy of reasonable facsimile of any hazard warning statement, label, material safety data sheet, or other information which will be provided to any person who is reasonably likely to be exposed to this substance regarding protective equipment or practices for the safe handing, transport, use, or disposal of the new substance. List in part III hazard information you include.

		Binding Option Mark (X)
Mark (X) this box if you attach hazard information.	[X]	[ ]

Part II-- HUMAN EXPOSURE AND ENVIRONMENTAL RELEASE -- Continued

Section A -- INDUSTRIAL SITES CONTROLLED BY THE SUBMITTER -- Continued

The information on pages 9 and 9a refer to consolidated chemical number(s): [X] **1** [ ] **2** [ ] **3** [ ] **4** [ ] **5** [ ] **6**

2. Occupational Exposure -- You must make separate confidentiality claims for the description of worker activity, physical form of the new chemical substance, number of workers exposed, and duration of activity. Mark (X) the "Confidential" box next to any item you claim as confidential.

(1) -- Describe the activities (i.e. bag dumping, tote filling, unloading drums, sampling, cleaning, etc.) in which workers may be exposed to the substance.
(2) -- Mark (X) this column if entry in column (1) is confidential business information (CBI).
(3) -- Describe any protective equipment and engineering controls used to protect workers.
(4) and (6) -- Indicate your willingness to have the information provided in column (3) or (5) binding.
(5) -- Indicate the physical form(s) of the new chemical substance (e.g., solid: crystal, granule, powder, or dust) and % new chemical substance (if part of a mixture) at the time of exposure.
(7) -- Mark (X) this column if entries in columns (3) and (5) are confidential business information (CBI).
(8) -- Estimate the maximum number of workers involved in each activity for all sites combined.
(9) -- Mark (X) this column if entry in column (8) is confidential business information (CBI).
(10) and (11) -- Estimate the maximum duration of the activity for any worker in hours per day and days per year.
(12) -- Mark (X) this column if entries in columns (10) and (11) are confidential business information (CBI).

Worker activity (i.e., bag dumping, filling drums) (1)	CBI (2)	Protective Equipment/ Engineering Controls (3)	Binding Option Mark (X) (4)	Physical form(s) & % new substance (5)	Binding Option Mark (X) (6)	CBI (7)	# of Workers Exposed (8)	CBI (9)	Maximum Duration		CBI (12)
									Hrs/Day (10)	Days/Yr (11)	
Unloading from Bottles		See continuation page. id: <P9SA2(3)C1R1>		Liquid, [redacted]		X	1		5	47.1	
Miscellaneous Activities Related to Liquid Processing		This process is completely automated and no workers are involved.		Liquid, [redacted]		X	1		3	28.3	
Sampling		See continuation page. id: <P9SA2(3)C1R3>		Liquid, [redacted]		X	2		1	9.4	
Miscellaneous Activities Related to Liquid Processing		See continuation page. id: <P9SA2(3)C1R4>		Liquid, [redacted]		X	2		1	9.4	

Mark (X) this box if the data continues on the next page. [ ]

Enter Attachment filename for Part II, Section A on the bottom of page 9a. [ ]

PMN Page 10a

2. Worker Exposure/Environmental Release

(1) -- From the diagram above, provide the letter for each worker activity. Complete 2-8 for each worker activity described.
(2) -- Estimate the number of workers exposed for all sites combined.
(4) -- Estimate the typical duration of exposure per worker in (a) hours per day and (b) days per year.
(6) -- Describe physical form of exposure and % new chemical substance (if in mixture), and any protective equipment and engineering controls, if any, used to protect workers.
(7) -- Estimate the percent of the new substance as formulated when packaged or used as a final product.
(9) -- From the process diagram above, enter the number of each release point. Complete 9-13 for each release point identified.
(10) -- Estimate the amount of the new substance released (a) directly to the environment or (b) into control technology to the environment (in kg/day or kg/batch).
(12) -- Describe media of release i.e. stack air, fugitive air (optional-see Instructions Manual), surface water, on-site or off-site land or incineration, POTW, or other (specify) and control technology, if any, that will be used to limit the release of the new substance to the environment.
(14) -- Identify byproducts which may result from the operation.
(3), (5), (8), (11), (13) and (15) -- Mark (X) this column if any of the proceeding entries are confidential business information (CBI).

Letter of Activity	# of Workers Exposed	CBI	Duration of Exposure		CBI	Protective Equip./Engineering Controls/Physical Form	% new substance	% in Formulation	CBI
(1)	(2)	(3)	(4a)	(4b)	(5)	(6)	(6)	(7)	(8)
A	10		0.28	70		See continuation page. id: <P10ASB2(6)C1R1>	[redacted]	[redacted]	X
B	20		0.28	70		See continuation page. id: <P10ASB2(6)C1R2>	[redacted]	[redacted]	X
C	20		0.28	70		See continuation page. id: <P10ASB2(6)C1R3>	[redacted]	[redacted]	X
D	20		0.28	70		See continuation page. id: <P10ASB2(6)C1R4>	[redacted]	[redacted]	X

Release Number	Amount of New Substance Released		CBI	Media of Release & Control Technology	CBI
(9)	(10a)	(10b)	(11)	(12)	(13)
1		[redacted]	X	Off-site Incineration Container residue is sent to incineration.	
2		[redacted]	X	See continuation page. id: <P10ASB2(12)C1R2>	
3		[redacted]	X	See continuation page. id: <P10ASB2(12)C1R3>	
4		[redacted]	X	POTW	

Mark (X) this box if the data continues on the next page. ☐

(14) Byproducts: | **(15) CBI** ☐

Enter Attachment filename for Part II, Section B. ☐

PRODUCT NAME: [redacted]

SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Identifier: [redacted]
General Use: Photoresist for Integrated Circuit Production
Product Description: Photosensitizer and Phenolic Resin Solution

MANUFACTURER:
JSR Micro, Inc.
1280 North Mathilda Ave.,
Sunnyvale, CA 94089
Telephone: +1-408-543-8800

EMERGENCY TELEPHONE NUMBERS:
CHEMTREC: +1-800-424-9300
(in USA) 24Hrs Every day
Telephone: +81-3-5565-6600
9:15-17:45 Jpn M-F
Facsimile: +81-3-5565-6641
24Hrs Every day

2. HAZARDS IDENTIFICATION

GHS Classification

Hazard Group	Hazard class		Category
Physical Hazards	Explosives		Not Classified
	Flammable gases		Not Classified
	Flammable aerosols		Not Classified
	Oxidizing gasses		Not Classified
	Gases under pressure		Not Classified
	Flammable liquids		Category 3
	Flammable solids		Not Classified
	Self-reactive substances and mixtures		Not Classified
	Pyrophoric liquids		Not Classified
	Pyrophoric solids		Not Classified
	Self-heating substances and mixtures		Not Classified
	Substances and mixtures which, in contact with water, emit flammable gases		Not Classified
	Oxidizing liquids		Not Classified
	Oxidizing solids		Not Classified
	Organic peroxides		Not Classified
	Corrosive to metals		Not Classified
Health Hazards	Acute toxicity	Oral	Not Classified
		Dermal	Not Classified
		Inhalation (Gasses)	Not Classified
		Inhalation (Vapors)	Not Classified
		Inhalation (Dusts and Mists)	Not Classified
	Skin corrosion/irritation		Category 2
	Serious eye damage/eye irritation		Category 1
	Respiratory or skin sensitization		Category 1 Skin
	Germ cell Mutagenicity		Not Classified
	Carcinogenicity		Not Classified
	Reproductive toxicity		Not Classified
	Specific target organ systemic toxicity-Single exposure		Category 3
	Target Organs		May cause narcotic effects and respiratory irritation.

	Specific target organ systemic toxicity-Repeated exposure	Not Classified
	Target Organs	NA
	Aspiration hazard	Not Classified
Hazardous to the aquatic environment	Acute aquatic toxicity	Not Classified
	Chronic aquatic toxicity	Not Classified

GHS label elements

Hazard symbols:

Flame	Corrosion	Exclamation mark		
				

Signal word: **Danger**

Hazard statement:

- Flammable liquid and vapor.
- Causes skin irritation.
- Causes serious eye damage.
- May cause an allergic skin reaction.
- May cause respiratory irritation, drowsiness or dizziness.

Precautionary Statements:

Prevention:

- Keep away from heat, sparks, open flames and hot surfaces. – No smoking.
- Keep container tightly closed.
- Ground/Bond container and receiving equipment.
- Use explosion proof electrical, ventilation, lighting and equipment.
- Use only non-sparking tools.
- Take precautionary measures against static discharge.
- Wear protective gloves, eye protection and face protection.
- Wash hands thoroughly after handling.
- Avoid breathing dust, fumes, gas, mist, vapors or spray.
- Contaminated work clothing must not be allowed out of the work place.
- Use only outdoors or in a well ventilated area.

Response:

- If on skin (or hair): Take off immediately all contaminated clothing and wash it before reuse. Rinse skin with water/shower.
- In case of fire: Use carbon dioxide, alcohol foam or dry chemical to extinguish.
- Specific treatment (see section 4 on this SDS)
- If skin irritation or rash occurs: Get medical advice/attention.
- If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- Immediately call a poison center, doctor, or seek medical attention if you feel unwell.

- If inhaled: Remove person to fresh air and keep comfortable for breathing.

Storage:

- Store in a well ventilated place. Keep container tightly closed. Keep cool.
- Store locked up.

Disposal:

- Dispose of contents/containers in accordance with local and federal regulations.

NFPA RATING (Scale 0 – 4): HEALTH = 2; FIRE = 2; REACTIVITY = 1

3. COMPOSITION / INFORMATION ON INGREDIENTS

Component	%	CAS No.
Phenolic resin	10-20	Proprietary
Photosensitizer	Less than 3	Proprietary
Ethyl lactate (EL)	55-65	97-64-3
Propylene glycol monomethyl ether acetate (PGMEA)	20-30	108-65-6

*Note- The specific chemical identity and exact percentage of composition of some ingredients have been withheld as a trade secret.

4. FIRST AID MEASURES

INHALATION:

May cause irritation to nose and throat. Remove exposed person to fresh air; perform artificial respiration if necessary.

EYE CONTACT:

Eye contact may cause irritation and corneal injury. Immediately flush eyes with plenty of water at least 15 min. Call a physician.

SKIN CONTACT:

Prolonged and repeated contact with skin may cause irritation and dermatitis. Flush skin with water and soap.

INGESTION:

Swallowing may cause nausea and pain in esophagus and stomach. Give large quantities of water, contact a poison center and call physician immediately.

NOTE TO PHYSICIAN:

Treatment may vary with condition of victim and specifics of incident.

5. FIRE-FIGHTING MEASURES

GENERAL HAZARD:

Combustible liquid. May release vapors that form flammable mixtures when temperatures are at or above the flash point. Toxic gases will form upon combustion.

EXTINGUISHING MEDIA:

Carbon dioxide, alcohol foam or dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES:

Water should be used to keep fire exposed containers cool and to dispense vapors. Firefighters should wear self-contained breathing apparatus.

FIRE AND EXPLOSION HAZARDS:

Combustible liquid. Toxic gases, smoke, and oxides of carbon will form upon combustion.

6. ACCIDENTAL RELEASE MEASURES

LARGE SPILL/SMALL SPILL:

For indoor spills, provide increased ventilation as required to minimize exposure. Contain, absorb, and cleanup the spill as indicated in the appropriate land or water section below. Dispose of absorbent and other waste in an appropriate chemical waste container. Wear proper personal protective equipment. Wash thoroughly after handling.

LAND SPILL:

Dike or absorb with inert absorbent material and transfer to D.O.T. container for disposal.

WATER SPILL:

Remove from surface by skimming or with suitable absorbent.

7. HANDLING AND STORAGE

GENERAL:

Store in original container in a dry area. Avoid heat, sunlight, and ignition sources. Open only under safe light and well ventilated conditions. Loosen closure cautiously before opening. When using this substance: (a) avoid breathing the substance; (b) avoid ingestion; (c) use respiratory protection when in dust or mist form. Wear chemical goggles, resistant gloves and protective clothing to prevent contact. Wash thoroughly after handling.

RECOMMENDED STORAGE TEMPERATURE:

Maintain the storage temperature below 35°C (95°F). This storage temperature is intended for health and safety purposes only and is valid within the shelf life + 3 month period. For technical applications, see the product specifications and label.

STORAGE PRESSURE:	Atmospheric
INCOMPATIBILITIES:	Strong oxidizing agents, strong acids, strong bases.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:

The use of local exhaust ventilation is recommended to control emissions near the source. Laboratory samples should be handled in a fumehood. Provide mechanical ventilation of confined spaces. Use explosion-proof ventilation equipment.

PERSONAL PROTECTION

RESPIRATORY PROTECTION:

Under conditions of frequent use or heavy exposure, respiratory protection may be needed. Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use. NIOSH approved respirators as follows:

Any chemical cartridge respirator with organic vapor cartridge(s).

Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s).

Any air-purifying respirator with a full facepiece and an organic vapor canister.

For Unknown Concentrations or Immediately Dangerous to Life or Health.

Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.

Any self-contained breathing apparatus with a full facepiece.

SKIN PROTECTION:

Wear impermeable gloves and clothing during activities where there is potential for direct skin contact with chemical.

EYE PROTECTION:

Wear primary eye protection such as splash resistant safety goggles with a secondary protection faceshield. Provide an emergency eye wash station and

quick drench shower in the immediate work area.

EXPOSURE GUIDELINE (S):

OSHA HAZARDS (29 CFR 1910.1200) Exposure Limits 8 hrs. TWA (ppm)

COMPONENT	OSHA PEL	ACGIH TLV
Phenolic resin	Not established	Not established
Photosensitizer	Not established	Not established
EL	Not established	Not established
PGMEA	100 (Cal-OSHA)	Not established

9. PHYSICAL AND CHEMICAL PROPERTIES

Properties	Value
Appearance:	Clear and pale yellow liquid
Odor:	Ester-like
Odor threshold:	No applicable information available
Vapor Pressure:	3.1 hPa at
	20 °C
Relative Density:	0.9 - 1.1
Solubility:	Moderate in water
Boiling Point:	146 °C
	294.8 °F
Flashpoint and Method:	45 °C (est.)
	113 °F (est.)
Flammable Limits:	1.5 % LEL
	11.4 % UFL

Properties	Value
Autoignition Temperature:	354 °C
	669.2 °F
pH:	No applicable information available
Melting/Freezing Point:	NA °C
	NA °F
Evaporation rate:	No applicable information available
Flammability:	Category 3
Vapor Density:	No applicable information available
Decomposition Temperature:	NA °C
	NA °F
Partition coefficient:	No applicable information available
Viscosity:	No applicable information available

10. STABILITY AND REACTIVITY

POSSIBILITY OF HAZARDOUS REACTIONS:
May react with strong oxidizing agents, strong acids, and strong bases.
CHEMICAL STABILITY:
Materials containing similar structural groups are normally stable. This material maybe sensitive to peroxide formation.
CONDITIONS TO AVOID:
Avoid heat, sunlight and ignition sources.
INCOMPATIBLE MATERIALS:
Strong oxidizing agents, strong acids, strong bases.
HAZARDOUS DECOMPOSITION PRODUCTS:
Combustion will produce toxic vapors and gases.

11. TOXICOLOGICAL INFORMATION

SOLVENT (PGMEA):
ACUTE TOXICITY

Oral	LD50	Rat	8,532 mg/kg
Dermal	LD50	Rabbit	>5,000 mg/kg

MUTAGENICITY

Ames test:	Negative
Chromosomal aberration test:	Negative

SOLVENT (EL):
ACUTE TOXICITY

Oral	LD50	Rat	>2,000 mg/kg
Dermal	LD50	Rabbit	>5,000 mg/kg

MUTAGENICITY

Ames test:	Negative

Photosensitizer 1:
MUTAGENICITY

Ames test:	Negative
Chromosomal aberration test:	Positive
Micronucleus test:	Negative

Photosensitizer 2:
ACUTE TOXICITY

Oral	LD50	Rat	>2,000 mg/kg

MUTAGENICITY

Ames test:	Negative
Chromosomal aberration test:	Negative

Photosensitizer 3:
MUTAGENICITY

Ames test:	Negative
Chromosomal aberration test:	Negative

Phenolic resin: No information available

CARCINOGENICITY:
Not known to be carcinogenic.
NTP: No, IARC MONOGRAPHS: No, OSHA Regulated: No

For potential routes of exposure, symptoms related to the toxicological characteristics, delayed and immediate effects and chronic effects from short and long-term exposure see Section 4 on this SDS.

12. ECOLOGICAL INFORMATION

SOLVENT (PGMEA): Eco toxicity:
Fish: LC50 96hr >100 mg/L (Oryzias latipes)
Crustacean: EC50 48hr 370 mg/L (Daphnia magna)
Algae: EC50 72 or 96hr >1000 mg/L (Pseudokirchneriella subcapitata)

SOLVENT (EL): Eco toxicity:
Fish: LC50 96hr 320 mg/L (Danio rerio)
Crustacean: EC50 48hr 560-683 mg/L (Daphnia magna)
Algae: EC50 72 or 96hr 2,300-3,500 mg/L (Pseudokirchneriella subcapitata)

Photosensitizer 1:	Eco toxicity: Fish: LC50 96hr >100 mg/L (Fish) Crustacean: EC50 48hr >100 mg/L (Daphnid) Algae: EC50 72 or 96hr 10-100 mg/L (Green Algae)
Photosensitizer 2:	Eco toxicity: [Estimated by ECOSAR] Fish: LC50 96hr 57.256 mg/L (Fish) Crustacean: EC50 48hr 121.078 mg/L (Daphnid) Algae: EC50 72 or 96hr 52.853 mg/L (Green Algae)
Photosensitizer 3:	Eco toxicity: Fish: LC50 96hr 10-100 mg/L (Fish) Crustacean: EC50 48hr 1.0-10 mg/L (Daphnid) Algae: EC50 72 or 96hr 10-100 mg/L (Green Algae)
Phenolic resin:	No information available

13. DISPOSAL CONSIDERATION

The user of this product must properly characterize the waste generated from the use of this product in accordance with all applicable federal, state and/or local laws and regulations in order to determine the proper disposal of the waste in accordance with all applicable federal, state and/or local laws and regulations.

14. TRANSPORT INFORMATION

TRANSPORTATION AND HAZARDOUS MATERIALS DESCRIPTION:
Package and transport in accordance with Department of Transportation (DOT) and other regulatory agency requirements.

U. S. DOT PROPER SHIPPING NAME:	UN1866, Resin solution, Class 3, III
IATA PROPER SHIPPING NAME:	Resin solution
IDENTIFICATION NUMBER:	UN1866

15. REGULATORY INFORMATION

US

OSHA HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200: Ensure that the hazards associated with this product are transmitted to employees by means of a hazard communications program, in accordance with federal and state Occupational Safety and Health Administration (OSHA) regulations.

CERCLA/SUPERFUND HAZARD CATEGORY: At the time of this document's preparation, none of the ingredients of this product were listed in 40 CFR 302.4. The list should be periodically checked for applicable updates.

SARA 313 INFORMATION: At the time of this document's preparation, none of the ingredients of this product were listed in 40 CFR 372. The list should be periodically checked for applicable updates.

TOXIC SUBSTANCES CONTROL ACT (TSCA): All of the compounds in this product are on the TSCA Inventory and/or are subject to a Low Volume Exemption. In accordance with federal regulations, this material shall be used only to industrially manufacture integrated circuits. In particular, this material shall not be distributed to any person, other than for disposal, until after it has been completely reacted. All users must utilize the worker protection measures and environmental release controls specified in this Safety Data Sheet and in EPA and OSHA regulations. Acknowledgment of receipt of this Safety Data Sheet shall be considered acknowledgement that the user will comply with these requirements.

CALIFORNIA PROPOSITION 65: At the time of this document's preparation, none of the ingredients of this product were included on the California Proposition 65 list of chemicals known to cause cancer or reproductive toxicity. The list should be periodically checked for applicable updates.

16. OTHER INFORMATION

REVISION SUMMARY

October 18, 2016	Original SDS established.

To the best of our knowledge, the information contained herein is accurate. However, neither JSR Corporation nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards, which exist.